

Application No 10/028,439
Amendment "B" dated August 6, 2004
Reply to Office Action mailed April 9, 2004

AMENDMENTS TO THE SPECIFICATION

Please amend paragraph [0027] (which is misnumbered in the application as paragraph [0025]) starting at page 8 of the application as reflected in the following marked-up version of the paragraph:

[0025] Still referring to Figure 2, the silicon substrate 118 includes a cone-shaped cavity 136 having inwardly sloping walls that are narrower at the top and broader at the bottom. In the cavity 136 is an optional ~~[[an]]~~ optical element 138, which is beneficially a micro-optic lens, and the end portion of an optical fiber 140. Figure 2 illustrates an optional thin silicon membrane 137 between the optical power sensor 116 and the optical element 138. In some applications that membrane is either completely or partially removed. A sealing compound 142, beneficially an epoxy material, retains the optical element 138 and the end portion of the optical fiber 140 within the cavity 136.

Please amend paragraph [0031] (which is misnumbered in the application as paragraph [0027]) at page 10 of the application as reflected in the following marked-up version of the paragraph:

[0029] Referring now to Figure 6, the bottom of the silicon substrate is then protected with an etch protector (such as silicon nitride), and an opening through that etch protector is formed at the desired location, again using standard photolithographic techniques. The opening exposes an area of the silicon substrate to chemical action. The exposed area is then anisotropically etched (using a suitable etchant such as potassium hydroxide). The anisotropic etching proceeds along crystalline planes at inwardly sloping angles so that the resulting cavity is wider at its bottom ~~then~~ than at its top. Etching is stopped when a thin membrane 137 (see Figure 2) is formed. If the membrane 137 is to remain in place, the fabrication of the silicon substrate 118 stops. Alternatively, the membrane can be reactive ion-etched to form an opening 121 from the cavity through the silicon substrate 118. This improves light transmission through from the VCSEL 112 to the optical fiber 140 (see Figure 2). The etch protector is then

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removed. An optional final step would be to coat the bottom of the membrane 137 with a thin, partially transparent material such as a metal film. This provides the opportunity to reduce the transmission from the VCSEL through the detector 116 and membrane 137, should that be desired.